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1841

School District No.
Genesee W. Seminary
Town of Lima
Livingston County.
1844.

THE
PATHOLOGY OF DRUNKENNESS,
OR THE
PHYSICAL EFFECTS OF ALCOHOLIC DRINKS,
WITH
Drawings of the Drunkard's Stomach.
BY THOMAS SEWALL, M. D.

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CORRESPONDENCE, &c.

BALLSTON CENTRE, SEPT. 10, 1842.

To the Hon. Samuel Young, Secretary of State, and Superintendent of Common Schools:

DEAR SIR—I am making an effort to place a bound volume of Dr. Sewall's work on the "*Pathology of Drunkenness*," with drawings of the human stomach as affected by the use of alcoholic drinks, in every school district library in the State. You are aware that the plan was submitted to the committee on education last winter and unanimously approved. It is also my intention to furnish a complete set of the colossal drawings, framed, to as many of our literary institutions as I can find means to supply. As superintendent of common schools, I should be pleased to receive your approbation of the measure, and to learn whether your department could assist me in the distribution of the bound volume.

I am dear sir,

Yours with great respect,
EDWARD C. DELAVAN.

SECRETARY OF STATE'S OFFICE, }
DEPARTMENT OF COMMON SCHOOLS, }
Albany, 12th September, 1842. }

DEAR SIR—I am informed by yours of the 10th inst., that you are "making an effort to place a bound volume of Dr. Sewall's work on the *Pathology of Drunkenness*," together with the plates, in every school district library in the State. I am satisfied that the colored plates of Dr. Sewall, exactly depicting the transitions of the human stomach from perfect health to the last stages of cancerous, alcoholic disease, will make a deeper and more lasting impression upon the minds of reflecting individuals, and even upon the thoughtless and ignorant, than any other work that has ever been published.

I wish the admirable lecture of Dr. Nott, contained in the *Enquirer*, could be added to the work of Dr. Sewall. The teachers of youth would then be able, by a display and explanation of the plates, and by reading the two lectures to their pupils, to communicate an admonition to the six hundred thousand children of this State, against the deadly poison of inebriation, which would never be forgotten.

Whatever can be done to make the rising generation more wise, more healthful, and consequently more happy than their predecessors, is worthy of all commendation. You have my best wishes for the success of your effort; and I will willingly aid in the distribution, to the extent of my ability.

Very respectfully, yours, &c.

S. YOUNG,
Sup't of Common Schools.

E. C. DELAVAN, Esq.

The following letter is from the Editor of the New-York District School Journal, the official organ of the State:

OFFICE OF THE DISTRICT SCHOOL JOURNAL, }
Albany, Sept. 23, 1842. }

DEAR SIR—As an aid to moral and physical education, I wish the admirable illustrations of the progress of Intemperance by Dr. Sewall, might hang in each of the eleven thousand school houses in our State. No more effectual appeal can be made to the mind, no more fearful warning can be given to the appetite, than these delineations of the ravage of that fatal poison, which so long has mingled death in the cup of pleasure. Impressions thus silently and certainly made on the mind of children, cannot readily be effaced; and though the picture speak not, its power will be felt, when other monitions are forgotten.

If in any way I can aid you in diffusing these "means of good," believe me, it will give much pleasure to

Yours very respectfully,

E. C. DELAVAN, Esq.

FRANCIS DWIGHT.

TO TEACHERS.

I am anxious to place a copy of this volume in each School District Library in the State of New-York. The plan has been fully approved by the Hon. Samuel Young, State Superintendent of Common Schools. May I request you to see to the preservation of the work, and as often as thought best, to exhibit the Plates and read Dr. Sewall's description of them to the scholars. It might be well also to permit the children to take the volume home, so that each individual in the district might also profit by it. This distribution will be an expensive one. The price of the volume (75 cents,) is a small sum for each district; perhaps the children might think the work of such value, as to feel willing to pay for it; if so, such collection would enable me to send it to other Districts in our country, where otherwise it might never reach. No claim is made, but I take the liberty of adding the suggestion. Should Districts unite in making collections to pay for the volume, remittances can be made to Oliver Scovil, Agent, Albany, POST PAID.

EDWARD C. DELAVAN.

THE ENQUIRER EXTRA.

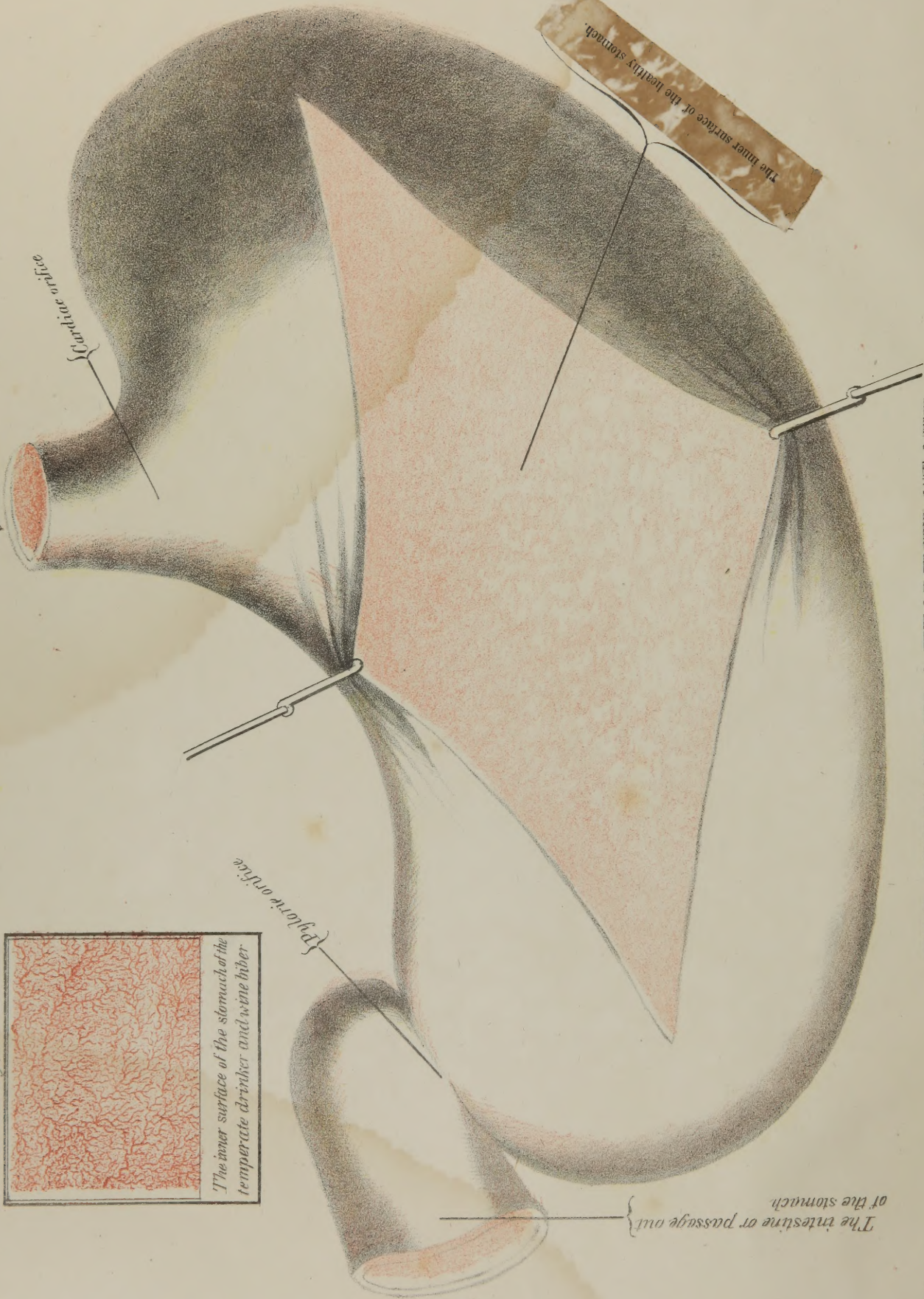
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Fig. 1.



The inner surface of the stomach of the temperate drinker and wine biber



THE STOMACH IN A HEALTHY STATE

From the dissections of W. E. Horner M.D. Professor of Anatomy in the University of Pennsylvania.

Copyright secured.

2d Edition

Chromolithography by J. H. Hall Albany N. Y.



THE STOMACH OF THE DRUNKARD.

From the dissections of Thomas Sewall M.D. Professor of Pathology and Practice of Med. in Columbian Coll. D.C.

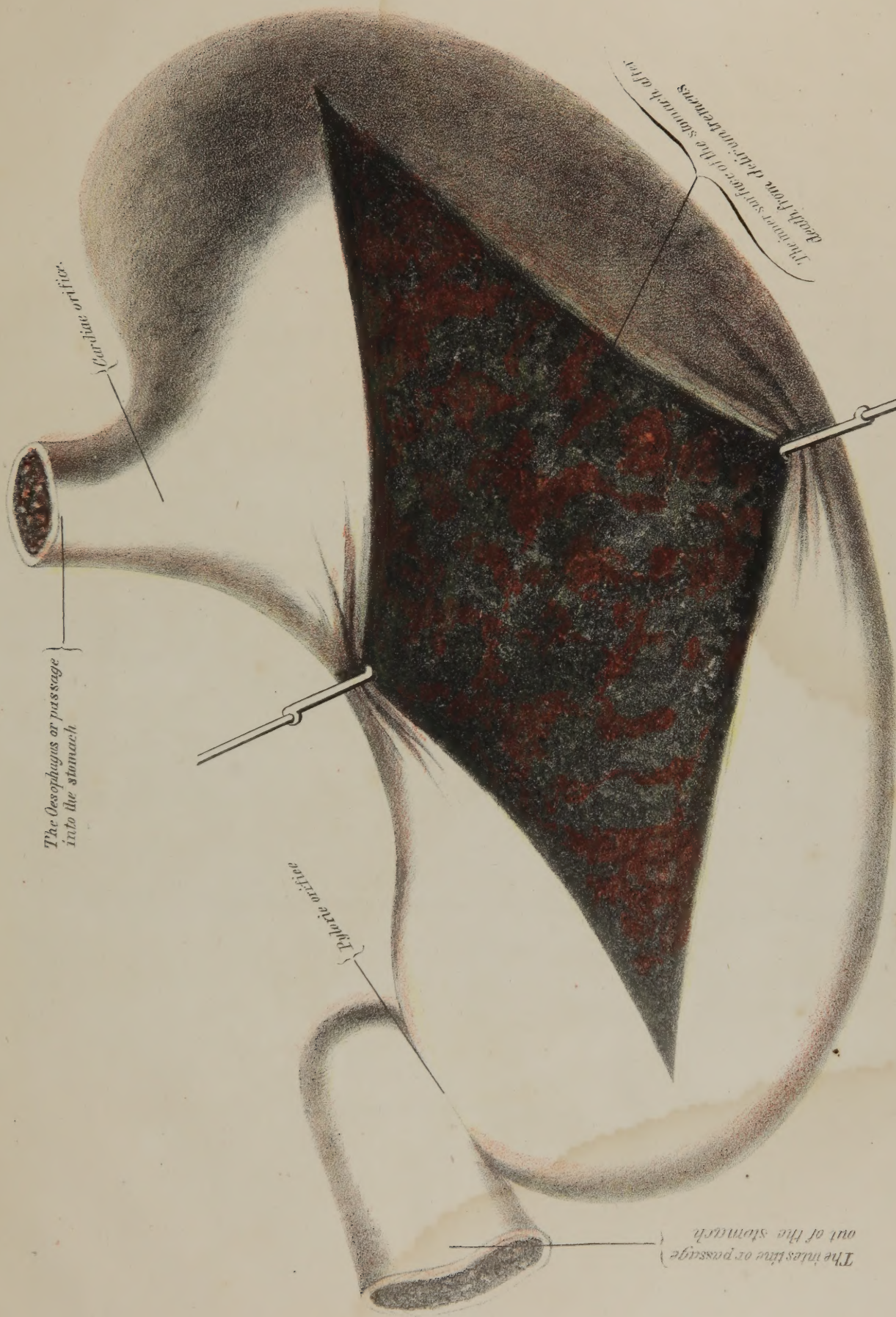
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THE STOMACH OF THE DRUNKARD AFTER A DEBACH.

From the dissections of Thomas Sewall, M.D. Professor of Pathology and Practice of Med. in Columbian Coll. D. C.

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THE STOMACH OF THE DRUNKARD AFTER DEATH FROM DELIRIUM TREMENS

From the dissections of Thomas Sewall M.D. Professor of Pathology and Practice of Med. in Columbian Coll. D.C.

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PATHOLOGY OF DRUNKENNESS,
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A LETTER ADDRESSED TO EDWARD C. DELAVAN, Esq.

BY THOMAS SEWALL, M. D.

Professor of Pathology and the Practice of Medicine in the Columbian College, District of Columbia.

ALBANY.
STEREOTYPED AND PRINTED BY C. VAN BENTHUYSEN.
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1841.

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OR THE

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WITH

DRAWINGS OF THE DRUNKARD'S STOMACH

A LETTER ADDRESSED TO EDWARD C. DELAFAYE, M.D.

BY THOMAS SEWALL, M.D.

Professor of Pathology and the President of Medicine in the College of Physicians and Surgeons of the City of New York.

ALBANY:
STEREOTYPED AND PRINTED BY C. VAN NESTER.
1841.

REMARKS ON DR. SEWALL'S LETTER,

BY THE EDITOR OF THE ENQUIRER.

It appears to us quite impossible for an unprejudiced mind to rise from the perusal of the admirable letter of Dr. Sewall, without a lasting and deep conviction, that one of the greatest delusions that has ever held possession of the human mind, causing an amount of wretchedness and loss of wealth which the most fertile imagination finds it impossible to estimate, is about to be dissipated; and, we trust, forever. Providence, in the case of Alexis St. Martin, provided a subject to establish beyond all contradiction, the great principle on which the temperance cause is now based, which is, *that intoxicating drinks are never beneficial, but always injurious to persons in health.* All can now understand why wine, intoxicating wine, is declared to be a mocker—it will be seen, it at once disturbs the healthful action of the stomach, and consequently the mind feels the injurious influence. We recollect when engaged in business, and while drinking two or three glasses of intoxicating wine at dinner, the bargains made in the afternoon were frequently disapproved the following morning; at the time we were much mortified at this unaccountable vacillation of mind within a few hours; the reason never occurred to us, until we abandoned the use of wine altogether. We then found that we had been “mocked,” and that our judgment had been impaired in proportion to the alcohol we had indulged in. We found too, that after drinking a glass or too of wine at dinner on the Sabbath, we listened to the afternoon service with very different feelings than to the morning service; and often accused the preacher of stupidity, when it was our own stupidity occasioned by that wine which “is a mocker.” Until we abandoned the use of this “mocker,” we could never account for this difference of feeling between the morning and afternoon service of the sanctuary; we then made the discovery, that we were under the influence of the “mocker” in the house of God. For all the sin we have committed, in times long passed, through ignorance of the true nature of all intoxicating liquors, we have asked, and we trust we have obtained, pardon.

A friend recently informed us that he had frequently watched the influence of a single glass of wine at dinner parties on the eye, and that he had invariably noticed a change, not only in the expression, but the pupil.

While in London, there was a grand procession of over 20,000 total abstainers; they traversed the great city for several hours, every avenue poured forth its population, every door and window was crowded to view a sight so novel; it was supposed at least 500,000 persons witnessed the spectacle; the procession terminated in one of the largest squares, where stages were erected at convenient distances, from whence the vast assemblage were addressed;

our station was upon one of them. An individual from the crowd soon called out, “I wish to say a word to you;” on joining him, he enquired, “do you know me?” we were obliged to reply in the negative, “well,” says he, “I know you. I once lived in Albany, in Washington street, in the same street with yourself, and by reading your temperance papers, I was converted to total abstinence; since then I have travelled over 40,000 miles, I have visited every part of the world, preaching total abstinence as I have travelled, and my drink has been confined to water. I have been exposed to hardships and privation of the severest character, but during the whole period I have enjoyed the most uninterrupted health. For your encouragement to persevere in this great work, I wished to communicate this fact and the result of my experience.”

Doctor Sewall has our warmest thanks for furnishing his important letter, as also for the drawings of the human stomach. We believe all coming generations will hail him as a great public benefactor. We are informed that it is the first time the human stomach has been thus exhibited through all its changes, from the use of alcohol. May God in his mercy bless the effort made we well know, under pressing professional duties and ill health; may it serve to arrest the temperate drinker in his dangerous course; may it bring to a full stand the poor diseased drunkard, and induce him to flee at once to total abstinence from all that can intoxicate—and in his case, as well at the communion table as a medicine. We trust the press, now scattering its hundreds of millions of sheets yearly, will sound the alarm, and will not be backward in proclaiming the truth now so clearly established by science, founded on the word of God; and may the Church rejoice at these developments; they are opening a bright day for her, and may she speedily cast out from her sanctuary those fabricated and deleterious substances, and substitute in their place the “Fruit of the Vine”—and may the time soon come, when not one of her members shall be found making, vending, drinking, or giving others to drink, that mocker, the use of which has so long filled the world with pauperism and crime, and kept from entering within her walls, millions of perishing beings.

May all classes, from the monarch to the beggar, be admonished; let them remember that God has said, and that too, without any qualification, that “*wine is a mocker,*” AND THAT SCIENCE CONFIRMS IT. Let all know that alcohol, whether in the purest wine, or in the most disgusting beer or whiskey, is a poison—an enemy to health and happiness—that to use it in health, is a species of suicide—an outrage on one’s self, on the community, and when its character is understood, as we understand it, its use is a sin against the God of Heaven.

EXPLANATION OF THE PLATES.

PLATE I.—*Fig. 1.* Represents the internal or mucous coat of the stomach in a healthy state, which in colour, is slightly reddish, tinged with yellow. It was drawn from an individual who had lived an entirely temperate life, and who died under circumstances which could not have changed the appearance of the organ after death.

Fig. 2. Of the same plate, represents a portion of the stomach of the Temperate Drinker—the man who takes his grog daily, but moderately, or who sips his wine with his meals. The blood vessels of the inner surface are so far enlarged, as to be visible, and are distended with blood.

PLATE II.—*Fig. 1.* Represents the stomach of the habitual drunkard, or hard drinker, and shews the mucous or internal coat, to be in a state of irritation, with its blood vessels, which are invisible while in a healthy state, to be enlarged and distended with blood. It was drawn from the stomach of one who had been an habitual drunkard for many years. It bears a strong resemblance in its vascular structure, to what are denominated the rum blossoms, seen upon the face of the hard drinker.

Fig. 2. Of the same plate, represents the inner coat of

the stomach, corroded with small ulcers, which are covered with white crusts, with the margin of the ulcers elevated and ragged.

PLATE III.—*Fig. 1.* Represents the mucous, or internal surface of the stomach of the drunkard, after a debauch of several days. It shows a high degree of inflammation, extending over the surface, changing its color to deep red, and in some points exhibiting a livid appearance.

Fig. 2. Of the same plate, represents the appearance of the cancerous stomach; and was taken from the case of a sea captain, who had been an habitual drinker of ardent spirits, and often in an undiluted state. The stomach is thickened, and scirrhus, with a corroding cancer of the size represented in the plate.

PLATE IV. Represents the state of the internal coat of the stomach of a drunkard, who had died in a state of Delirium Tremens. It was covered by a dark brown flaky substance, which on being removed, showed the stomach to have been in a state of high inflammation before death. In some points it was quite dark, as if in an incipient state of mortification.

LETTER TO E. C. DELAVAN.

TO EDWARD C. DELAVAN, Esq.:

Sir—From a consideration of the deep interest which you have taken in the Temperance Reformation, and the eminent services you have rendered to this and other countries, by a series of philanthropic efforts to eradicate one of the greatest evils of the age, I am induced to comply with your request, by furnishing the accompanying drawings of the Drunkard's stomach, with a few remarks upon the pathology of intemperance; delineating certain morbid changes produced by alcoholic drinks, as they have fallen under my observation.

The following remarks will explain the circumstances under which these cases occurred, and the phenomena attending them.

For upwards of thirty years, I have been more or less engaged in pathological researches; during which I have enjoyed many opportunities of inspecting the stomach of the drunkard after death, in the various stages and degrees of inebriation; and these drawings will be found to present a pretty accurate delineation of the principal morbid changes produced upon that organ by intemperance; changes which are eminently worthy of being brought to the view of the unsuspecting sufferer, and which I should hope, might have some effect in deterring the temperate from the use of alcoholic poison.

If the morbid effects of intemperance are in some degree various in different individuals; if they are not developed with the same degree of power and rapidity in one case as in another, it is nevertheless true that alcohol is a poison, forever at war with man's nature, and in all its forms and degrees of strength, produces irritation of the stomach, which is liable to result in inflammation, ulceration and mortification, a thickening and induration of its coats, and finally scirrhus, cancer and other organic affections; and it may be asserted with confidence, that no one who indulges habitually in the use of alcoholic drinks, whether in the form of wine or the more ardent spirits, possesses a healthy stomach.

In addition to the morbid specimens which I furnish, I present you with one drawing of the healthy stomach, which will enable you to institute a comparison, and the more fully to appreciate the morbid changes produced by alcohol.

To enable the unprofessional reader the better to understand the morbid effects of alcoholic drinks upon the stomach, as represented in the drawings, I beg leave to call your attention to a few remarks upon the anatomy and physiology of the digestive canal.

Digestion is one of the most important of all the functions of the animal economy; indeed it is indispensable to

the due performance of all the other functions; consequently whenever this becomes impaired, the whole system languishes, and all the other functions become sooner or later affected also. The object of digestion is to convert the food into nutriment fitted to sustain and renovate the system, and to supply the waste that continually takes place in every part.

As food is seldom found in a state fit for nutrition, it has necessarily to undergo various changes in the digestive organs; changes which require that these organs should be extensive and complicated in their structure, and healthy in their action.

The digestive canal is divided, according to its physiological arrangement, into, 1st, the mouth; 2d, the pharynx and œsophagus; 3, the stomach; 4th, the small intestines, and 5th, the large intestines.

The mouth is the part concerned in masticating or grinding the food; by the pharynx and œsophagus, it is swallowed and conveyed to the stomach, where it undergoes a most important change, commonly called digestion, by which it is converted into a substance denominated chyme.

The stomach is situated in the cavity of the abdomen, occupying the epigastric, and a portion of the left hypochondriac region. It is a hollow organ, somewhat conoidal in its figure, and has been compared in its form to a bag-pipe. It is capable of containing in the adult, when moderately distended, about one quart. The left half of the organ is much larger than the right. It has two curvatures, the greater and the less. It has two openings; the first is called the cardiac, and the second the pyloric orifice. The cardiac orifice is situated in the lesser curvature, near the left extremity of the organ, communicates with the œsophagus, and is the passage by which the food is received into the stomach. The lower or pyloric orifice is situated at the right extremity, communicates with the intestines, and forms the passage by which the food, after the process of digestion, is completed, is conveyed out of the stomach. This latter opening is garnished by a circular band of muscular fibres, by which it is capable of becoming completely closed during the process of digestion. The stomach is composed of three coats. The first is the peritoneal or serous coat; which is extremely thin, and forms the outer covering. The second is the muscular coat, and is composed of muscular fibres running in different directions, and is that coat upon which the contraction of the organ depends when it is empty. The third is the mucous or internal coat, and is about a line in thickness. It presents, when the stomach is contracted to its smallest dimensions, a corrugated or wrinkled appearance, which disappears as soon as the organ

is distended. This coat exhibits to the eye somewhat of a mottled appearance; of a reddish complexion, slightly tinged with yellow. Its surface resembles velvet, from which the term villous coat has been applied to it. In its texture it is soft, loose and easily lacerated. It has opening upon its surface a multitude of minute orifices, which lead to small glands designed to secrete mucus. These three coats are connected to each other by the intervention of cellular substance, but are separable by maceration and dissection. The stomach is very largely supplied with blood-vessels, nerves, and absorbents. Indeed the nervous texture of the organ is so largely supplied and fully expanded between the mucous and the muscular coats as to form, apparently, a fourth covering, sometimes denominated the nervous coat.

The digestion of the food in the stomach is performed by the action of the gastric juice, a fluid secreted by the mucous or internal coat; or by some small glands seated in this coat, and which possesses the extraordinary power of dissolving animal and vegetable substances, which are first deprived of the principle of life; but upon living bodies it has no action, as shewn by the experiments of Spallanzani and others. For example, if the legs and feet of a living frog be thrust down into the stomach of a lizard, and be confined in that situation, the gastric juice has no action upon them, so long as the frog lives; but if the frog be killed and be replaced in this situation, they are digested to a pulp in a few hours. The gastric fluid has even the power of dissolving the stomach itself when the organ is deprived of life; and consequently in some persons who die suddenly and in a state of full health, the stomach is found a few hours after death, softened, broken or dissolved.

There are some substances, however, though destitute of vitality upon which the gastric juice has no action, or if any, it has not the power of converting them into nutriment; and alcohol is one of this number.

The small intestines, while they form numerous convolutions, constitute one continuous tube, extending from the pyloric orifice, or right extremity of the stomach, and terminating abruptly in the large intestines. This portion of the digestive tube gradually diminishes in size as it descends.

The food having been digested by the stomach and converted into chyme, passes out at the pyloric orifice into the small intestines, when the nutritious is separated from the innutritious portion, as it mingles with the bile and pancreatic juice; two fluids which are poured into the intestines near their upper extremity. The nutritious portion is absorbed by a set of vessels denominated lacteals, which open their numerous mouths upon the inner surface of the canal. By these it is transported under the name of chyle, to the blood-vessels, and there unites with the blood in a state prepared to renovate this fluid, and render it fit to sustain and nourish the system, and supply the waste continually going on; while the innutritious part of the food passes on to the large intestines.

The large intestines from the lower portion of the digestive canal, and though much greater in diameter than the

small intestines, are far shorter. They form a mere reservoir for the innutritious portion of the chyme. The small and large intestines together, constitute one continuous tube, which is nearly six times the length of the body. Except in two small sections, they have three coats, corresponding with those of the stomach, and like that also are supplied with blood-vessels, nerves and absorbents.

Having thus briefly described the anatomical and physiological arrangement of the digestive canal, I will now proceed to notice some of the morbid effects of alcoholic drinks upon it, as they have been presented to my notice.

In PLATE 1. *Fig. 1st*, we have a representation of the internal surface of the stomach in a healthy state, taken from an individual who was entirely temperate, which is copied from a sketch furnished by Professor Horner, of Philadelphia, one of the ablest anatomists of the country or age. The subject from which it was originally drawn, came under Professor Horner's own observation, and the dissection was made by his own hand; and he says that the individual was not only healthy, but remarkably temperate and regular in all his habits; he therefore considers the case invaluable, as furnishing a standard of observation. It is of a color slightly reddish, tinged with yellow, and exhibits something of a mottled appearance; although supplied with a multitude of blood-vessels, none of them are so large as to be visible to the naked eye. This healthy and natural appearance of the stomach would doubtless continue from the period of childhood to that of old age, if it were acted upon only by appropriate food and drink.

In *Fig. 2d* of the same plate, we have exhibited the internal surface of the stomach of the temperate drinker, the man who takes his glass of mint sling in the morning, and his toddy on going to bed; or of him who takes his two or three glasses of Madeira at his dinner. And here the work of destruction begins. That beautiful network of blood-vessels which was invisible in the healthy stomach, being excited by the stimulus of alcohol, becomes dilated and distended with blood, visible and distinct. This effect is produced upon the well known law of the animal economy, that an irritant applied to a sensitive texture of the body, induces an increased flow of blood to the part. The mucous or inner coat of the stomach is a sensitive membrane, and is subject to this law. A practical illustration of this principle is shewn by reference to the human eye. If a few drops of alcohol or any other irritating substance, be brought in contact with the delicate coats of the eye, the network of fine vessels which were before invisible, becomes distended with blood and are easily seen. If this operation be repeated daily, as the temperate drinker takes his alcohol, the vessels become habitually increased in size and distended with blood. Besides this injected and dilated state of the vessels of the stomach, the mucous coat of the organ always becomes thickened and softened; and these changes occur in the temperate drinker as well as in the confirmed drunkard.

It is by this temperate drinking that the appetite of the inebriate is first acquired; for by nature man has no taste

or desire for alcohol; it is as unnatural and averse to his constitution as to that of the horse or the ox; nor is there any apology for its use by man, that does not equally apply to the brute.

PLATE II. *Fig. 1st*, of this series, represents the stomach of the confirmed drunkard; the man who has become habitually accustomed to the use of alcoholic drinks. And here we find the blood-vessels of the inner coat, which in the temperate drinker were only slightly enlarged, so fully developed as to render the most minute branches visible to the eye, like the rum blossoms on the drunkard's face; and this enlargement does not depend upon the perpetual presence of alcohol, as in the temperate drinker, but it has become so permanent and fixed, that they maintain their unnatural size even after death; unless indeed the inebriate has for some time previous to this event abandoned the use of alcohol, and given nature time to restore them to their natural size. The mucous coat becomes thickened and softened, which often results in ulceration. It sometimes happens, after this state has continued for some time, that all the coats of the stomach become implicated, and are found in a very thickened and indurated condition; and thus the way is prepared for scirrhus, cancer and other organic affections. In this state, the inebriate is never easy or satisfied, unless his stomach is excited by the presence of this or some other narcotic poison. Whenever these are withheld, he is afflicted with loss of appetite, nausea, gnawing pain and a sinking sensation at the stomach, lassitude, debility and temporary disturbance of all the functions of the body.

It is under these circumstances, and in this condition of the stomach, that the drunkard finds it so difficult to resist the cravings of his appetite, and to reform his habits. Difficult but not impossible. Thousands thus far sunk to ruin have reformed, and thousands are now undergoing the experiment. But it is only by total abstinence, that reformation can be accomplished. No one may hope to reform by degrees, or to be cured by substituting one form of alcohol for that of another. So long as he indulges in the smallest degree, so long will his propensity to drink be perpetuated, and his stomach exhibit traces of disease.

What takes place in the stomach of the reformed drunkard, the individual who abandons the use of all intoxicating drinks? The stomach by that extraordinary power of self-restoration with which it is endowed, gradually resumes its natural appearance. Its engorged blood-vessels, become reduced to their original size, and its natural color and healthy sensibility return. A few weeks or months, according to the observation I have made, will accomplish this renovation; after which the individual has no longer any suffering or desire for alcohol. This process however is greatly facilitated, and rendered more easy to the sufferer, by cupping, blistering and other counter irritation over the region of the stomach; by the use of cooling medicines and vegetable diet. It is nevertheless true, and should be ever borne in mind, that such is the susceptibility of the stomach of the reformed drunkard, that a repetition of the use of alcohol in the *slightest degree, and in any form, under any circumstances,*

or in any place, revives the appetite; the blood-vessels again become dilated, and the morbid sensibility of the organ is re produced. Abstinence, therefore, total abstinence, at once and forever, must be the pledge of him who means to stand.

PLATE II. *Fig. 2d*, presents a view of the ulcerated or apthous condition of the drunkard's stomach; a state which frequently exists, but is not readily apprehended on account of the obscurity of the attendant symptoms. It consists in numerous small ulcerations extending over the internal coat, and which are usually covered with a white crust, producing the apthous appearance. Upon wiping off the crust, the mucous surface is found broken and covered with small corroding sores, of greater or less size and depth, with ragged and inflamed edges; and sometimes the inflammation extends over the intervening spaces. These ulcerations are produced by the irritating effects of alcoholic drinks. I cannot better give you an account of this affection, than by a reference to the observations of Dr. Beaumont, a gentleman who has produced one of the most rare and interesting works ever published upon the powers of the gastric juice and the functions of the stomach. You will recollect that while these experiments and observations bear with peculiar force upon the subject of alcoholic drinks, they were instituted prior to the commencement of the temperance enterprise, and were made without the slightest reference to this subject. Dr. Beaumont cannot, therefore, be suspected of having his mind prejudiced, or of a desire to adapt the results of his researches to the opinions of the present time, or to promote the cause for which they are here introduced. The following account will explain the occasion of his researches, and show the authority upon which his observations are based.

In the year 1822, Alexis St. Martin, a Canadian boy, of French descent, aged 18, of robust and healthy constitution, received a shot from a musket in the left side, by which the integuments, muscles and a part of one rib were carried away, and the stomach perforated. In this state, he fell into the hands of Dr. Beaumont, then a distinguished army surgeon of the United States, stationed upon our northern frontier. The boy was cured, but the edges of the wound in the stomach became adherent to the wound in the side of the chest, and the opening from without into the stomach remained unclosed; being two and a half inches in circumference; so that the food and drink could only be retained by the use of a pad, and subsequently by the protrusion of a fold of the inner coat of the stomach. This state of the aperture afforded Dr. Beaumont an opportunity of making important observations and experiments upon the digestion of food, and of ascertaining by ocular inspection, the condition of the interior of the stomach, the state of its mucous coat, and the influence of various agents upon it, particularly the effect of different kinds of food and drink. At length St. Martin was brought to the city of Washington, where I had many opportunities of witnessing the Doctor's experiments, and can testify to the accuracy with which they were made and are detailed. Commencing with the 237th page of his work, I find the following record ·

"July 28, 9 o'clock A. M. Weather clear. Wind N. west, brisk. Thermometer 66°. Stomach empty—not healthy—some erythema (inflammation,) and aphthous patches on the mucous surface. St. Martin has been drinking *ardent spirits*, pretty freely for eight or ten days past—complains of no pain, nor shews symptoms of any general indisposition—says he feels well and has a good appetite.

"August 1, 8 o'clock A. M. Examined stomach before eating anything—inner membrane morbid—considerable erythema and some aphthous patches on the exposed surface—secretions vitiated—extracted about half an ounce of gastric juice—not clear and pure as in health—quite viscid.

"August 2, 8 o'clock A. M. Circumstances and appearances very similar to those of yesterday morning. Extracted one ounce of gastric fluids, consisting of unusual proportions of vitiated mucus, saliva and some bile, tinged slightly with blood, appearing to exude from the surface of the erythema and aphthous patches, which were tenderer and more irritable than usual. St. Martin complains of no sense of pain, symptoms of indisposition, or even of impaired appetite. Temperature of stomach 101°.

"August 3, 7 o'clock A. M. Inner membrane of stomach unusually morbid—the erythematous appearance more extensive, and spots more livid than usual; from the surface of some of which exuded small drops of grumous blood—the aphthous patches larger and more numerous—the mucus covering thicker than common, and the gastric secretions much more vitiated. The gastric fluids extracted this morning were mixed with a large proportion of thick ropy mucus, and considerable muco-purulent matter, slightly tinged with blood, resembling the discharge from the bowels in some cases of chronic dysentery. Notwithstanding this diseased appearance of the stomach, no very essential aberration of its function was manifested. St. Martin complains of no symptoms indicating any general derangement of the system, except an uneasy sensation, and a tenderness at the pit of the stomach, and some vertigo with dimness and yellowness of vision, on stooping down and rising again—has a thin yellowish brown coat on his tongue, and his countenance is rather sallow—pulse uniform and regular; appetite good; rests quietly, and sleeps as well as usual.

"August 4, 8 o'clock A. M. Stomach empty; less of those aphthous patches than yesterday; erythematous appearance more extensively diffused over the inner coats, and the surface inclined to bleed; secretions vitiated. Extracted about an ounce of gastric fluids consisting of ropy mucus, some bile, and less of the muco-purulent matter than yesterday; flavor peculiarly fœtid and disagreeable; alkallescent and insipid; no perceptible acid; appetite good; rests well and no indications of general disease or indisposition.

"August 5, 8 o'clock A. M. Stomach empty; coats less morbid than yesterday; aphthous patches mostly disappeared; mucous surface more uniform, soft, and nearly of the natural, healthy color; secretions less vitiated. Extracted two ounces of gastric juice, more clear and pure than that

taken for four or five days last past, and slightly acid; but containing a larger proportion of mucus, and more opaque than usual in a healthy condition.

"August 6, 8 o'clock A. M. Stomach empty; coats clean and healthy as usual; secretions less vitiated. Extracted two ounces gastric juice, of more natural and healthy appearance, with the usual gastric acid flavor; complains of no uneasy sensations, or the slightest symptom of indisposition; says he feels perfectly well, and has a voracious appetite; but not permitted to indulge it to satiety. He has been restricted from full and confined to low diet, and simple, diluent drinks for the last few days, and has not been allowed to taste of any stimulating liquors, or to indulge in excesses of any kind.

"Diseased appearances, similar to those mentioned above, have frequently presented themselves in the course of my experiments, and examinations, as the reader will have perceived. They have generally, but not always succeeded to some appreciable cause. Improper indulgence in eating and drinking has been the most common precursor of these diseased conditions of the coats of the stomach. The free use of *ardent spirits, wine, beer, or any intoxicating liquor*, when continued for some days, has invariably produced these morbid changes. Eating voraciously or to excess; swallowing food coarsely masticated or too fast; the introduction of solid pieces of meat, suspended by cords into the stomach, or of muslin bags of aliment secured in the same way, almost invariably produce similar effects if repeated a number of times in close succession.

"These morbid changes and conditions are, however, seldom indicated by any ordinary symptoms or particular sensations described or complained of, unless when in considerable excess, or when there have been corresponding symptoms of a general affection of the system. They could not, in fact, in most cases, have been anticipated from any external symptoms, and their existence was only ascertained by actual ocular demonstration.

"It is interesting to observe to what extent the stomach, perhaps the most important organ of the *animal* system, may become diseased without manifesting any external symptoms of such disease, or any evident signs of functional aberration. Vitiated secretions may also take place, and continue for some time without affecting the health in any *sensible* degree.

"Extensive, active or chronic disease may exist in the membranous tissues of the stomach and bowels, more frequently than has been generally believed; and it is possible that there are good grounds for the opinion advanced by a celebrated teacher of medicine, that most febrile complaints are the effects of gastric and enteric inflammations. In the case of the subject of these experiments, inflammation certainly does exist to a considerable extent, even in an *apparent* state of health—greater than could have been believed to comport with the due operations of the gastric functions."

We cannot place too high a value upon the observations and experiments of Dr. Beaumont, as they are the result of ocular demonstration, an actual looking into the interi-

or of the stomach from hour to hour, and from day to day, for a number of successive years; accurately noting the different states of the organ in health and disease, and the effect of the various kinds of food, drinks and other agents upon it.

I beg you to mark his words. "The free use of *ardent spirits, wine, beer or any of the intoxicating liquors*," says he, "when continued for some days has *invariably* produced these morbid changes."

Here we find that *wine and beer* produce these morbid changes as well as ardent spirits; and well they may, since they contain alcohol as their basis, as well as rum, brandy, whiskey and gin, though in rather smaller proportion.

There is another fact stated by Dr. Beaumont, to which I wish to call your special attention. Having spoken of the effects of intemperance in producing the morbid appearances referred to in the stomach of St. Martin, he says, "These morbid changes and conditions are, however, *seldom indicated by any ordinary symptoms* or particular sensations described or complained of unless when *in considerable excess*. They could not, in fact, have been anticipated by any external symptoms, and their existence was only ascertained by actual ocular demonstration."

Here is a most important pathological fact brought to view and established by ocular demonstration, and one which should be ever present to the mind of him who uses alcohol. It is this:—that the stomach may become extensively diseased from the influence of alcoholic drinks, without there being present any general constitutional derangement, or other obvious manifestations of its morbid state. This fact is particularly applicable to the temperate drinker, for in his case the narcotic poison of alcohol so blunts and deranges the healthy sensibility of the stomach, that it holds out no signal of its sufferings. But though the manifestations of disease may be absent, he should be aware that morbid changes, extensive and fatal may exist; and that while he is sipping his wine, or regaling himself upon his brandy and water, he is laying the foundation of a broken constitution, and premature decay and death. And this is what doubtless takes place with the temperate drinker, and is the true cause of the marked difference between his constitution, when prostrated by disease, and that of the man who leads a life of total abstinence; a difference seen and appreciated by every practitioner of medicine. In the one case disease is easily vanquished, the system re-acts, and the patient soon recovers his wonted energy:—in the other case, if he does not sink under the disease, he lingers, and every attack leaves him in a more broken and enfeebled state; a consequence inevitable since all the other functions of the body are intimately connected with, and dependant upon, that of the stomach. Whenever this organ fails to perform its office, all the other functions become deranged, and the whole system languishes.

From a careful observation of this subject during many years of practice, I am persuaded that tens of thousands of temperate drinkers, die annually of diseases, through which the abstemious would pass in safety.

PLATE III. *Fig. 1st* represents the state of the drunkard's stomach after a debauch. It was drawn from the case of one who had been for several days in a state of inebriation, but who came to his death suddenly from another cause. It shews the internal coat of the organ to have been in a state of high inflammation, and presents several livid spots, with dark grumous blood oozing from the surface.

I have had several opportunities of inspecting the stomach under similar circumstances, and I believe this plate presents about the ordinary appearance of the organ when excited to a state of inflammation by excessive indulgence in the use of alcoholic drinks. It has been remarked, that the symptoms attendant upon the ulcerated state of the stomach, and especially if unaccompanied by much inflammation, are often obscure, and such as not to denote much constitutional derangement. But in this condition of the organ the whole system suffers. There is loss of appetite, nausea, vomiting, ardent thirst, pain in the head, red eyes, bloated face, coated or red tongue, frequent pulse and symptomatic fever. These symptoms are more or less intense, according to the duration of the debauch, the quantity of liquor drank, being modified in some degree, by the constitution and habits of the individual. They are, in some respects, such as attend the ordinary inflammation of the stomach, produced by other causes, and the appropriate treatment in both is found to be nearly the same. It consists in total abstinence from all stimulating drinks, general bleeding, cupping, leeching and blistering over the stomach, cooling and mucilaginous drinks, and general perspiration with entire rest.

The following case so fully confirms the principles here laid down, and at the same time furnishes so valuable an admonition, that I must beg leave to present you with the outlines of its history:

A gentleman equally distinguished for the powers of his mind, and the great influence which he wielded in the councils of the nation, unfortunately acquired in early life, the habit of intemperance; but it was not that intemperance which is perpetual, it only came over him at distant periods, not oftener than once or twice in the year. In the intervals he practiced entire abstinence, while at these periods he wholly abandoned himself to his propensity, and would continue drinking until his stomach was wrought up to a high state of inflammation. I was called to attend him in at least twelve of these paroxysms, during as many years, and conducted him each time, safely through the storm. It was done upon the principle of withholding at once all stimulus, and allowing the free use of iced water, with other cooling drinks, with cupping and blistering over the stomach.

In ten or twelve days he was usually well and able to attend to his business. Unfortunately, in his last paroxysm, he came under the care of those who advised that he should not abandon his cup at once, but wind off his debauch by degrees. The advice was followed, and he fell a victim to the experiment. He died suddenly, in the vigor of his

days, and the height of his usefulness; lamented and wept by all who knew him.

No one may hope to be weaned from the love of alcoholic drinks, or to be cured of a fit of intoxication by diminishing the quantity alone, or by substituting one form of the poison for another. As well might the culprit who receives his fifty lashes to-day, expect a palliation of his sufferings by the infliction of forty lashes to-morrow, and thirty the day after, or by substituting the cow-hide for the cat of nine tails. The practice is opposed to all experience, and to every principle of man's constitution.

The stomach is inflamed, and must be cured like inflammation produced by other causes, by withholding stimulants, and instituting a cooling antiphlogistic treatment.

Fig. 2d of the same plate presents a specimen of the cancerous stomach. It was drawn from the stomach of a gentleman who had for many years followed a sea-faring life. He was not regarded as intemperate, but used his grog daily, and was much in the habit of taking a glass of brandy in the morning, undiluted, to excite an appetite for breakfast. At length dyspepsia came on, with pain and a burning sensation in the region of the stomach, vomiting of his food an hour or two after his meals, followed by extreme emaciation and death. Upon examination of the body, the whole of the stomach, except a small portion at the left extremity, was found in a scirrhus state, its coats thickened to the extent of about two inches, and the cavity of the organ so far obliterated as scarcely to admit the passage of a probe from the left to the right extremity; so that for a considerable time before death, none of the nutriment derived from food and drink could have passed into the intestines. Near the right extremity of the stomach was a cancerous ulcer of the size and appearance represented in the drawing.

Since the foregoing case occurred, two others of the same character, and produced by the same cause, have fallen under my observation. In both these, the one male and the other a female, the stomach was thickened, scirrhus, and cancerous, and so extensively disorganized as not to admit of the passage of the chyme out at the pyloric orifice. The prominent symptoms in these two cases also, were excruciating pain, a vomiting of the food in a half digested state, followed by extreme emaciation. These subjects had indulged freely in the use of alcoholic drinks for years, and continued the habit till the stomach would no longer receive it.

In these cases of induration, scirrhus and cancer, the pyloric portion of the stomach, is more frequently the seat of disease than the left or cardiac portion, but the cardiac portion of the organ does not always escape, as the following case which occurred in my practice several years since, will show.

Mr. C., a sea-faring man of forty-five, belonged for many years to the class of temperate drinkers, but as he lived on he became a regular hard drinker, though never a sot. At length he began to complain of occasional fits of dyspepsia, heart burn and acid eructations; and these symptoms were followed by a difficulty in passing solid food into

the stomach, unless when masticated very finely and swallowed in small portions. As he expressed himself, there appeared to be an obstruction in the passage near the stomach. His case was examined by several physicians, who pronounced it to be a stricture in the lower part of the œsophagus. But the obstruction did not yield to the remedies for that disease, and the difficulty increased until nothing but liquids would pass, and finally even liquids were returned after reaching the point of obstruction. He suffered from gnawing and lancinating pains in the region of the stomach, as well as from extreme hunger and thirst. I have known him to swallow two gallons of water in successive mouthfuls in a single night, which would pass to the point of obstruction, and then be regurgated, affording only momentary relief; and this was his condition for several weeks previous to his dissolution.

Upon opening the body after death, about three inches of the lower portion of the œsophagus was found in a thickened and scirrhus state, the disease extending to the stomach and so involving the cardiac orifice, as nearly to obliterate the opening and prevent the passage of food and drink. The mucous coat of the stomach exhibited strong traces of the effects of intemperance, and the pyloric portion of the organ was found in a scirrhus state.

PLATE IV. represents the appearance of the stomach of the drunkard who dies in a state of mania a potu, or delirium tremens.

The history of the case from which this drawing was made, and which occurred in my practice some years since, will illustrate the character of the disease, and the morbid condition of the stomach.

The subject was a man, amiable in disposition, courteous in manners, high in public life. By degrees he became intemperate, and although he drank daily, his excessive indulgence was confined to paroxysms of greater or less duration. Several times during the continuance of these paroxysms, he was thrown into a state of delirium tremens, but from which he soon recovered. At length one of his paroxysms of drinking came upon him, which was of longer continuance than usual, and of greater severity. For more than a week his mind was entirely deranged, and it required two persons to confine him to his room. He imagined that his nearest friends were his greatest enemies and persecutors, and were constantly laying plans for his destruction. He fancied that he saw spectres and devils, and files of armed soldiers entering his apartment, deadly serpents crawling over his bed, and wild beasts ready to devour him. There was one individual in particular, a certain man who had often won his money at the billiard table, whom he imagined he saw grinning and skulking round the chamber, waiting an opportunity to rob him of his money. His bodily functions became more and more disturbed, accompanied with great debility; a cold, profuse, clammy sweat, and small and sinking pulse. These symptoms were followed by general spasms, which soon closed the scene.

After death the body was examined. Upon laying open the stomach it presented the appearance exhibited in

the plate. It contained a considerable quantity of dark fluid resembling coffee grounds; the inner surface was covered with a dark brown flaky substance, upon removing which, it exhibited marks of having been in a high state of inflammation; some portions appearing of a deep red or mahogany color, and others quite black, as if in a state of incipient mortification. It was obvious that the dark flaky matter which lined the inner coat, as well as that lying loosely in the cavity of the organ, was blood which had exuded from the vessels of the inflamed surface, and had been acted upon by gastric juice, converting it into the black vomit.

I have had several opportunities of inspecting the body after death of those who have fallen by intemperance in a state of Delirium Tremens; and have found not only the symptoms attending the affection, but the morbid appearance upon dissection to be extremely uniform, and my observations fully confirm the opinion entertained by most modern pathologists, that the disease has its seat originally in the stomach, and that the affection of the brain is purely sympathetic, and secondary: an opinion sustained also by the course found most successful in the treatment of the disease.

Having thus spoken of intemperance as affecting the condition of the stomach, you will naturally inquire whether these effects can be produced by no other cause than alcoholic drinks? To such inquiry, I answer that they can. There are various abuses of the stomach which may cause them. They may be produced by excess in eating, by the use of gross stimulating and luxurious diet, by too much animal food, and especially if improperly masticated, by rich and indigestible sauces and gravies, by stimulating condiments in great abundance, such as cayenne pepper, mustard and the different spices, the habitual use of opium in large doses. With regard to this latter article, although the investigations upon this subject are too limited to authorize me to speak with entire confidence, yet from certain facts which have come to my knowledge, I have little doubt, could an opportunity be afforded for inspecting the stomach of the opium eater and smoker, of the Chinese and Turkish empires, that we should find this organ in a very diseased condition.

In a communication just received from the Rev. Peter Parker, M. D., an eminent surgeon, who has resided for several years in China, as a medical missionary from this country, he says "while the prejudices and superstitions of the Chinese, do not admit of post mortem examinations for the benefit of science, I have the best evidence next to that of pathological anatomy, that the primary effects of opium, are upon the nervous system. Yet the *digestive organs*, as well as the whole of the chylopoietic viscera, are early involved in the ruin to which the entire fabric of body and mind is precipitated. This is apparent by the early loss of appetite, habitual and long protracted constipation of the bowels, and the consequent wasting of the adipose and muscular tissues. As the work of destruction advances, hæmoptisis and pulmonary consumption supervene, or

the individual is affected with oedema of the lower extremities, general anasarca and ascites, which are soon followed by death. In other cases the effects are more specific and violent upon the brain and nervous system, producing violent and permanent mania, so that it becomes necessary to restrain the patient from acts of violence upon his nearest and best friends. Sometimes idiocy is the consequence; the victim loses the power of speech, the eyes roll in the most fearful manner, the evacuations become involuntary, and his apparent sufferings are indescribable."

The striking similarity in the effects produced upon the body and mind, by the habitual use of opium among the Chinese and those which follow the use of innoxious drinks among other nations, affords a fair inference, that the stomach in both cases suffers from the same morbid changes, and would exhibit upon dissection, the same pathological conditions.

It should be borne in mind that while alcoholic drinks make their first and strongest impression upon the stomach, their morbid effects are not limited to this organ; the whole of the intestinal canal, and more especially the small intestines, participate more or less in their influence. The internal coat becomes irritated, inflamed, softened and ulcerated, and occasionally affected with those other organic changes delineated in the drawings of the stomach. Nor are the consequences of intemperance confined to the digestive canal alone. The distant parts of the body become in time affected also. The liver, the brain, the heart, the lungs and the kidneys become the seat of alcoholic influence, an influence which is transmitted to them in two ways. The first is upon the principle of sympathy; the second is through the medium of the circulation, and the immediate action of the alcoholic principle upon the organs as it passes through them, mingled with blood. Both may be illustrated by familiar examples. The individual who has become exhausted by labor and fasting, finds his muscular power diminished and his whole system enfeebled. Upon partaking of his food, his strength is immediately restored—restored long before his food is digested, or any nourishment can have been derived from it. This effect is produced by the stimulus of the food upon the stomach, which impression is transmitted to all the other organs of the body through the medium of the nervous system, upon the principle of sympathy. The second, through the medium of the circulation, may be shown by two facts. The odour of the drunkards breath, furnishes us with one of the earliest indications of intemperance. This is occasioned by the exhalation of the alcoholic principle from the bronchial vessels and air cells of the lungs; not of pure alcohol, as taken into the stomach, but as it has been absorbed and become mingled with the blood and subjected to the action of the different organs of the body, and not containing any principle which contributes to the nourishment or renovation of the system, is cast out with other excretions as poisonous and hurtful. Magendie long since ascertained by experiment, that diluted alcohol when subjected to the absorbing power of the veins, is taken up by them, is mingled with the blood, and afterwards passes off by the pul-

monary exhalents. The case of a drunkard is mentioned who used to amuse his comrades by passing his breath through a narrow tube and setting it on fire as it issued from it.

The perspirable matter which passes off from the skin, becomes charged with the odor of alcohol in the drunkard, and in some cases furnishes evidence of the kind of spirit drank. Two cases are related by Dr. McNish, the one in a claret and the other in a port drinker, in which the moisture exhaled from their bodies had a ruddy complexion, similar to the wine upon which they had committed their debauch. These facts show us that alcoholic drinks are absorbed, mingle and circulate with blood, and therefore act immediately upon the different organs of the body.

It is upon these two principles that alcoholic drinks produce their morbid effects upon the different organs.

The liver. Alcohol in every form and proportion produces a strong and speedy effect upon this organ when used internally. Its first effect usually is to increase the action of the liver, and sometimes to such a degree as to result in inflammation. Its secretion often becomes changed from a bright yellow to a green or black, and from a thin fluid to a substance resembling tar in its consistence; and this change not unfrequently leads to the formation of billiary calculi, or gall stones. There often follows an enlargement of the organ, and a change in its structure. Aware of this fact, the poultry dealers of England are in the habit of mixing a quantity of spirit with the food of their fowls, in order to increase the size of the liver; that they may be enabled to supply the epicure with a greater abundance of that part of the animal which he regards as the most delicious. I have met with cases in which the liver has become so far enlarged from intemperance as to weigh from eight to twelve pounds, instead of four or five, its usual weight. The inflammation of the organ not unfrequently terminates in suppuration and the formation of extensive abscesses. The liver sometimes, however, even when it manifests upon dissection great organic change in its structure, is found rather diminished in volume. This was the case in the person of the celebrated tragedian, George Frederick Cooke, who died several years since in the city of New-York. This extraordinary man was long distinguished for the profligacy of his life, as well as the native vigor of his mind and body. At the time of his death, his body was opened by Dr. Hosack, who found that the liver while it was rather diminished in size, was in a state of induration, and surprisingly hard, so as to make considerable resistance to the knife; and it was of a lighter color than natural. The whole substance of the organ was studded with tubercles, and the blood vessels, which are numerous and large in the healthy state, were nearly obliterated; shewing that the circulation had nearly ceased long before death. I have met with several cases in the course of my dissections in which the liver had become shriveled and indurated; its blood vessels diminished and the organ greatly changed in its structure; the evident consequence of long continued habit of intemperance.

The brain. This organ also suffers from intemperance. Inflammation and engorgement are frequent consequences of the use of alcoholic drinks, and may take place at the time of a debauch, or arise sometime afterwards, during the stage of debility from a loss of the healthy balance of action in the system. Inflammation of the organ, when it is acute, is usually attended by furious delirium and other indications of high cerebral excitement. It may arise from sympathy with an inflamed or irritated stomach, or it may take place from the immediate action of alcohol upon it as it is transfused into the system. In the following case the affection of the brain seems to have arisen from the latter cause. A man was taken up dead in the streets of London, soon after having drank a quart of gin upon a wager. He was carried to the Westminster Hospital and dissected. In the ventricles of the brain there was found a considerable quantity of limpid fluid, distinctly impregnated with gin, sensible to the taste, the smell and to the test of inflammability. The liquid was supposed to be about one third gin.

Dr. Armstrong, an eminent physician of England, who possessed ample opportunities for investigating this subject, says that he has found the free use of intoxicating liquors, a frequent cause of chronic inflammation and engorgement of the brain and its membranes.

It is a fact familiar to anatomists, that alcohol has the effect of hardening the brain and other organs which contain albumen, when subjected to the action; and it is a common practice to immerse the brain in ardent spirits for a few days, in order to render it firmer for dissection; and upon examining the brain after death, of such as have long been accustomed to the use of ardent spirit, it is said that the organ is generally found harder and less elastic and yielding, than in temperate persons.

The heart. It has generally been supposed that the heart is less frequently affected by intemperance than most of the other vital organs; but from several cases which have fallen under my observation, and from the fact that it sympathises strongly with the stomach, and is thrown into a state of unnatural excitement by the use of alcoholic drinks, the very effect produced by the violent agitation of the passions, the influence of which upon this organ is found so injurious, I am inclined to think that it seldom escapes uninjured in the habitual drunkard.

The following case came under my notice several winters since. A large, athletic man, long accustomed to the use of ardent spirit, on drinking a glass of raw whiskey dropped instantly dead. On carefully dissecting the body, no adequate cause of the sudden cessation of life could be found in any part except the heart. This organ was free from blood, hard and firmly contracted, as if affected by spasm.

A few years since I saw an individual while engaged in public debate, drop instantly dead from an affection of the heart, being at the time highly stimulated by alcohol, and under a strong excitement of his passions. I am convinced that many of those cases of sudden death which take place with intemperate persons, are the result of a spasmodic ac-

tion of the heart from sympathy with the stomach, or some other part of the system. The use of ardent spirit no doubt tends to produce an enlargement of the organ, promotes the ossification of its valves, as well as the development of other organic affections.

The lungs. Respiration in the inebriate is generally oppressed and laborious, especially after eating or violent exercise; and he is teased with a cough attended by copious expectoration in the morning, and especially after his recovery from a fit of intoxication; and these symptoms go on increasing, and, unless arrested in their progress, often terminate in fatal bronchitis and consumption.

This affection of the lungs is produced in two ways: first, by the immediate action of the alcoholic principle upon the highly sensitive membrane which lines the trachea, bronchial vessels and air-cells of the lungs, as it is poured out by the exhalents; and second, by the sympathy which is called into action between the lungs and other organs, already in a state of disease, and more especially that of the stomach and liver.

I have met with many cases in the course of my practice, of cough and difficult breathing, which could be relieved only by regulating the functions of the stomach, and which soon yielded on the patient's ceasing to irritate this organ with ardent spirit. I have found the liver still more frequently the source of this affection, and on restoring the organ to its healthy condition by laying aside the use of alcoholic drinks, all the pulmonary symptoms have subsided.

On examining the lungs of the drunkard after death, they are frequently found adhering to the walls of the chest hepatized, or affected with tubercles.

The kidneys. These organs and others immediately associated with them, are seldom found in a healthy state after death in the inebriate. The kidneys become enlarged, softened, granulated and of a pale color; and these effects are always found, to exist in a greater or less degree even in the temperate drinker. And the use of alcoholic drinks, even in a temperate degree, lead to some of the most harassing and fatal affections to be found in the whole catalogue of diseases. But though an important subject, and upon which much might be said in reference to intemperance, I pass on to notice an affection, which, though common, seems scarcely to have attracted the attention of those who have written upon the effects of alcoholic drinks.

Paralysis of the lower extremities. This disease which I shall here describe is not that paralysis which takes place suddenly from an affection of the brain, or spinal marrow, but a gradual diminution of the power of sensation and of motion. Several of these cases have occurred to me within the last twenty years, three of which I will state.

The first was in an active business man of forty-five, who gradually acquired the habit of tippling, though he never drank to intoxication. His practice was to take small quantities of brandy, gin, wine, &c., at short intervals. He at length began to complain of debility, a sense of numb-

ness in his lower limbs, and an inability to walk with his accustomed activity. These symptoms gradually increased, and were soon followed by other mortifying indications of imbecility. The complaint increased till he could neither walk nor stand, and for months before his death, he was lifted from his bed to his chair. Several times during the progress of the case he partially recovered, but it was only in proportion as he suspended the use of alcoholic drinks.

Upon examination after death, the mucous coat of his stomach was found in a state of irritation, such as is usually met with in the case of the confirmed drunkard, and as represented in the second plate, figure first. The small intestines through the greater part of their extent, seemed to have participated in the irritation of the stomach.

The second case was that of a highly respectable man, who made shipwreck of fair prospects and a good character, by contracting the habits of intemperance upon entering public life. I was frequently called to attend him, on account of indisposition produced by paroxysms of inebriation, and yet so assiduously did he conceal his intemperance, that it was long before any one but myself suspected the cause. He seldom drank any ardent spirit, but kept his demijohn of old Madeira, which he used profusely. He first complained of weakness and want of sensibility in the lower extremities, and an inability to walk, especially to ascend long flights of steps. Upon a full representation of his situation, and the consequences that must ensue, he was induced to abandon his wine, and almost immediately recovered all his powers; but upon returning to it sometime afterwards, he relapsed into all his former weakness, and if now living is lost to his family and country.

The third case is that of a Mr. —, a man of thirty, of fine, robust constitution. He gradually acquired the habit of tippling, but it was not upon ardent spirit. He was never drunk, and no one suspected him of intemperance but his family. He had not exactly the drunkard's breath, nor much of his demeanor or aspect. He consulted me several times on account of a numbness and loss of power in his lower limbs. It was not for a considerable time that I came at the real cause of the difficulty, so carefully did he conceal his habits. At length I discovered that he kept in his grocery a pipe of wine for his own use, of which he drank frequently through the day, and would often visit his store at an early hour in the morning and late at night to renew his potations. I informed him that wine was the cause of all his complaints, upon which he abandoned the traffic and his habit of drinking together. His limbs almost immediately regained their accustomed energy. He is now, after six years, in good health and a sober man.

It had been asserted by physicians of eminence, who have enjoyed ample opportunity for observation, that intemperance in the parents confers upon the offspring, not only a predisposition to their own vice, but entails upon them a liability to diseases, both mental and physical.

One writer upon this subject observes, the free use of

intoxicating drinks by the parents, produces a predisposition in the children to intemperance, insanity, and various diseases of both body and mind, and if the cause be continued, becomes hereditary and is transmitted from generation to generation; occasioning a diminution in size, strength and energy, a feebleness of vision, a feebleness and imbecility of purpose, an obtuseness of intellect, a deprivation of moral taste, a premature old age, and a general deterioration of the whole character. This is the case in every country and in every age. Another says instances are known, where the first children of a family who were born when their parents were temperate, have been healthy, intelligent and active, while the last children who were born after the parents had become intemperate, were dwarfish and idiotic. Another medical gentleman writes, I have no doubt that a disposition to nervous diseases of a peculiar character, is transmitted by drunken parents to their offspring. There are numerous other recorded facts upon this subject, which together with several cases that have fallen under my own observation, leave no doubt upon my mind, that the effects of intemperance are liable to be transmitted from parent to child; and I have long been in the habit of admonishing mothers, not to poison their system or contaminate their milk during the period of gestation and nursing, by the use of intoxicating drinks.

In answer to the question which I propounded to Dr. Parker, is it apparent from the observations which you have made upon the Chinese, that the effects of opium descend from parent to child as affecting either the intellectual or physical constitution of their offspring? He replies, "I do not recollect at this time a solitary instance in which the confirmed victim of the use of opium, has become a parent, and this fact often forced itself upon my attention, that the free use of this narcotic poison, incapacitates them to perpetuate their species; and indeed this imbecility is often complained of by them, when they apply for medical advice." That the free and habitual use of intoxicating drinks often leads to the same consequences, but more especially the habitual use of wines, is a fact known to every experienced observer, from the days of Shakespeare to the present time.

But time would fail me, were I to attempt an account of half the pathology of drunkenness. *Dyspepsia, jaundice, emaciation, corpulence, dropsy, ulcers, rheumatism, gout, tremors, palpitation, hysteria, epilepsy, palsy, lethargy, apoplexy, melancholy, madness, delirium tremens and premature old age*, compose but a small part of the catalogue of diseases produced by alcoholic drinks. Indeed there is scarcely a morbid affection to which the human body is liable, that has not, in one way or another, been produced by them; there is not a disease but they have aggravated, nor a predisposition to disease which they have not called into action; and although their effects are in some degree modified by age and temperament, by habit and occupation, by climate and season of the year, and even by the intoxicating agent itself; yet the general and ultimate consequences are the same.

But I pass on to notice one state of the system produced by alcoholic drinks, too important and interesting to leave unexamined. It is that *predisposition to disease and death* which so strongly characterizes the drunkard in every situation of life.

It is unquestionably true, that many of the surrounding objects in nature are constantly tending to man's destruction. The excess of heat and cold, humidity and dryness, noxious exhalations from the earth, the floating atoms in the atmosphere, the poisonous vapors from decomposed animal and vegetable matter, with many other invisible agents, are exerting their deadly influence; and were it not that every part of his system is endowed with a self-preserving power, a principle of excitability, or in other words, a vital principle, the operations of the economy would cease, and a dissolution of his organic structure take place. But this principle being implanted in the system, reaction takes place, and thereby a vigorous contest is maintained with the warring elements without, as well as with the principle of decay within.

It is thus that man is enabled to endure from year to year, the toils and fatigues of life, the variations of heat and cold, and the vicissitudes of the seasons—that he is enabled to traverse every region of the globe, and to live with almost equal ease under the equator, and in the frozen regions of the north. It is by this power that all his functions are performed from the commencement to the close of his life.

The principle of excitability exists in the highest degree in the infant, and diminishes at every succeeding period of life; and if man is not cut down by disease or violence, he struggles on, and finally dies a natural death; a death occasioned by the exhaustion of the principle of excitability. In order to prevent the too rapid exhaustion of this principle, nature has especially provided for its restoration by establishing a period of sleep. After being awake for sixteen or eighteen hours, a sensation of fatigue ensues, and all the functions are performed with diminished precision and energy. Locomotion becomes feeble and tottering, the voice harsh, the intellect obtuse and powerless, and all the senses blunted. In this state the individual anxiously retires from the light, and from the noise and bustle of business, seeks that position which requires the least effort to sustain it, and abandons himself to rest. The will ceases to act, and he loses in succession all the senses; the muscles unbend themselves and permit the limbs to fall into the most easy and natural position; digestion, respiration, circulation, secretion and the other functions, go on with diminished power and activity; and consequently the wasted excitability is gradually restored. After a repose of six or eight hours, this principle becomes accumulated to its full measure, and the individual awakes and finds his system invigorated and refreshed. His muscular power is augmented, his senses are acute and discriminating, his intellect active and eager for labor, and all his functions move on with renewed energy. But if the stomach be oppressed by food, or the system

excited by stimulating drinks, the sleep, though it may be profound, is never tranquil and refreshing.

The system being raised to a state of feverish excitement, and its healthy balance disturbed, its exhausted excitability is not restored. The individual awakes, but finds himself fatigued rather than invigorated. His muscles are relaxed, his senses obtuse, his intellect impaired, and his whole system disordered; and it is not till he is again under the influence of food and stimulus that he is fit for the occupations of life. And thus he loses the benefits of this wise provision of repose designed for his own preservation.

Nothing, probably, tends more powerfully to produce premature old age than disturbed and unrefreshing sleep.

It is also true, that artificial stimulus, in whatever way applied, tends constantly to exhaust the principle of excitability of the system, and this in proportion to its intensity, and the freedom with which it is applied.

But there is still another principle on which the use of alcohol predisposes the drunkard to disease and death. It acts on the blood, impairs its vitality, deprives it of its red color, and thereby renders it unfit to stimulate the heart, and other organs through which it circulates; unfit, also, to supply the materials for the different secretions, and to renovate the different tissues of the body, as well as to sustain the energy of the brain; offices which it can perform only while it retains the vermilion color, and other arterial properties. The blood of the drunkard is several shades darker in its color than that of temperate persons, and also coagulates less readily and firmly, and is loaded with serum; appearances which indicate that it has exchanged its arterial properties for those of venous blood. This is the cause of the livid complexion of the inebriate, which so strongly marks him at the advanced stage of intemperance. Hence, too, all the functions of his body are sluggish, irregular, and the whole system loses its tone and energy. If alcohol, when taken into the system, exhausts the vital principle of the solids, it destroys the vital principle of the blood also; and if taken in large quantities produces sudden death; in which case the blood, as in death produced by lightning, by opium, or by violent and long continued exertion, does not coagulate.

The principles laid down are plain, and of easy application to the case before us.

The inebriate having, by the habitual use of alcoholic drinks, exhausted to greater or less extent the principle of excitability in the solids, the power of reaction, and the blood having become incapable of performing its offices also, he is alike predisposed to every disease, and rendered liable to the inroads of every invading foe. So far, there-

fore, from protecting the system against disease, intemperance ever constitutes one of its strongest predisposing causes.

Superadded to this, whenever disease does lay its grasp upon the drunkard, the powers of life being already enfeebled by the stimulus of alcohol, he unexpectedly sinks in the contest, but too frequently to the mortification of his physician, and the surprise and grief of his friends. Indeed, inebriation so enfeebles the powers of life, so modifies the character of disease, and so changes the operation of medical agents, that unless the young physician has studied thoroughly the constitution of the drunkard, he has but partially learned his profession, and is not fit for a practitioner of the present age.

These are the reasons why the drunkard dies so easily, and from such slight causes.

A sudden cold, a pleurisy, a fever, a fractured limb, or a slight wound of the skin, is often more than his shattered powers can endure. Even a little excess of exertion, an exposure to heat or cold, a hearty repast or slight emotion of the mind, not unfrequently extinguishes the small remains of the vital principle.

The fearful epidemic, the Asiatic Cholera, which so lately spread consternation and dismay over more than half the civilized world, wherever it appeared, singled out the intemperate for its victims, in a marked and most extraordinary manner. If in some instances the sober and temperate were borne off in the common ruin, it was seldom, except when some powerful predisposing or exciting cause, overwhelmed the system.

I have thus endeavored, according to your request, to furnish a few remarks upon the pathology of drunkenness. The sketch I have given you is brief and imperfect, and forms a mere outline of this important subject, but so far as it extends, it is based upon facts, which I have no fear will bear the test of future observation. You will perceive that a few passages are extracted from my address, already before the public, but they are here introduced as applicable to the occasion.

Allow me in conclusion, to congratulate you, and your co-laborers, upon the good already achieved by your efforts. Multitudes have been emancipated from a state of the most degrading servitude; disease has been arrested in its ravages; enterprise brought back in a thousand instances, fresh and vigorous to the great purposes of the age; banished happiness restored to the social circle; and new worshippers called around the altar of God. For the universal consummation of such blessings, every philanthropist will pray, and every patriot extend the helping hand.

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